



# Data Buoy Cooperation Panel - A Retrospective

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DBCP – 31



# Objective

- Chronicle the history of the DBCP
- Document successes and accomplishments
- Highlight approaches
- Acknowledge contributions



# The “Product”

- Final form is still under consideration
- Web based
  - Effective use of links
- Tell the story of the DBCP
- Consultation with Executive Board



# Methodology

- Literature Review of published reports
  - [http://www.wmo.int/pages/prog/amp/mmop/other\\_reports.html](http://www.wmo.int/pages/prog/amp/mmop/other_reports.html)
  - [http://www.wmo.int/pages/prog/amp/mmop/meeting\\_reports.html](http://www.wmo.int/pages/prog/amp/mmop/meeting_reports.html)
  - Operations and Achievements of the DBCP – March 2012 – Etienne Charpentier
- Interviews with Chairs, Technical Coordinators, Member Countries, Colleagues, and more



# Outline



- Before the DBCP ...
- Review of DBCP 1 – 30
  - Organization
  - Action Groups
  - Task Teams
  - Pilot Projects
  - Capacity Building
  - Vandalism
  - And more ...



# FGGE Drifting Buoy 1978





# Pre-DBCP



- Joint WMO/IOC Informal Planning Meeting on Drifting Buoy Programmes – Geneva, Dec., 1979
  - Establish an international mechanism to coordinate drifting buoy initiatives
  - Follow up to FGGE - 368 drifting buoys measuring SST and atmospheric pressure
    - Oceanographers cautious due unknown accuracy of SST and relationship of buoy drift to ocean currents
  - Propose to create international body to deal with operational meteorological observing program; preserve opportunity for oceanographic component
  - Data to be distributed on GTS using Service Argos



## Pre-DBCP - 2



- 12 Countries participated in meeting – Chaired by John Garrett, Canada
  - Argentina, Australia, Canada, Chile, France, Germany, Japan, Norway, Poland, Senegal, USSR, USA – also, WMO, IOC, ICSU, Svc. Argos, COST-43, SCOR, IGOSS, JOC
- At least 6 Countries planned to continue operating a drifting buoy programme
  - Australia, Canada, France, Norway, UK, USA
- Recommended creation of an organizational body on drifting buoy activities to plan and co-ordinate related operational and research programmes.





# Origin of DBCP



- Joint WMO/IOC Preparatory Meeting for the Establishment of a Drifting Buoy Consortium – Geneva, April, 1985
  - Chaired by Henderson, Australia
  - 13 countries participated
    - Argentina, Australia, Canada, Chile, France, Iceland, Netherlands, Norway, Saudi Arabia, Spain, USSR, UK, USA



## Origin of DBCP - 2



- Recommended:
  - Drifting Buoy Co-operation Panel be established
  - Principal objectives to optimize use of global drifting buoy deployments, increase amount of data available for WWW, WCRP, WMO and IOC
  - WMO and IOC Secretariats to Support
  - Dedicated Technical Coordinator
  - Terms of Reference for DBCP and TC
  - Establishment of Regional Action Groups



# DBCP -1



- October 1985 in Toulouse, France
- Canada, France, Iceland, Netherlands, Norway, Spain, UK, USA, USSR (CLS, COST-43, SCOR, SCAR, WMO, IOC); 19 participants; Chair was only DBCP officer
- established ToRs for TC; basic operating procedures, trust fund (voluntary contributions -Australia, Canada, France, USA). IOC to manage funds related to TC position. Budget \$US76K
- 291 operational drifters; Annual Report 30 pages



# DBCP-10, 1994

## La Jolla, CA, USA





# DBCP - 30



- Weihai, China, October 2014
- 15 countries, about 90 participants including EB, JCOMMOPS, WMO, IOC, JTA, CLS, manufacturers
- 10 Action Groups, 4 Task Teams, 3 Pilot Projects, User Requirements, S&T Workshop
- 1532 operational drifters, ~ 50% reporting air p
- Operating principles, implementation strategy, Terms of Reference, Publications
- Budget ~\$400K, annual report 172 pages



# DBCP-30, Weihai, China





# People



- Chairs

- John Garrett, Canada, 1985
- Christophe Billard, France, 1986 – 1989
- Derek Painting, UK, 1989 – 1995
- Graeme Brough, Australia, 1995 – 2003
- David Meldrum, UK, 2003 – 2010
- Al Wallace, Canada, 2010 – 2014
- Jon Turton, UK, 2014 -



# People - 2



- Technical Coordinators
  - David Meldrum, UK, 1987 – 1989
  - Etienne Charpentier, France, 1989 – 2006
  - Hester Viola, Australia, 2006 – 2010
  - Kelly Stroker, USA, 2007 – 2010
  - Champika Gallage, 2014 -





# Technical Coordinators





# Achievements



- 1986 MoU signed with Service Argos
- 1987 first TC begins work in Toulouse, hosted by CLS
- 1<sup>st</sup> Action Group – EGOS established
- 1988 – DBCP Logo adopted
- 1989 2<sup>nd</sup> TC begins work in Landover, hosted by CLS; relocates to Toulouse in 1993
- Development of lower cost drifters with a drogue to integrate meteorological and oceanographic needs
- IABP confirmed as Action Group



# Arctic Observers



Photo courtesy D. G. Barton © 1992



## Achievements - 2



- QC tools developed
- 1992 – DBCP Ties available
- Air deployment of drifters
- In 1993, Panel expanded to include moored buoys and became Data Buoy Co-operation Panel
- By DBCP 10, amount of data on GTS had doubled
- At DBCP 10, vandalism was first highlighted; Sub-Group on Technical Developments established; IPAB and ISABP approved as action groups



# 6M Nomad Moored Buoy





## Achievements - 3



- 1995 – manual for construction of low cost drifter published
- 2nd Vice-Chair position created
- DBCP 11 – 1<sup>st</sup> Scientific and Technical Workshop
- DBCP 12 – IBPIO established
- Early buoy failures highlighted at DBCP 13; GDP added as Action Group
- 1998, SVP-B construction manual updated; DBCP brochure finalized; SOT duties added to TC



## Achievements – 4



- DBCP 15 – Evaluation Sub-Group established; need for metadata standards noted, buoy code changes
- 2000 – Argo TC position established, JCOMMOPS concept endorsed; buoy lifetimes improved; barometer upgrade program supported
- DBCP 17 – DBCP formally part of JCOMM; buoy lifetimes increased and data quality good



## Achievements - 5



- DBCP 18 – value of air pressure information for NWP demonstrated; NPDBAP established; transfer of programs (TAO, Pirata, tsunameter) to NDBC; technical report on moored buoy safety issued
- 2003 – target for operational buoys on GTS 1250; daily buoy data increased by 20%; drogue loss noted as issue; Vice-Chair positions augmented – Europe, Asia, Southern Hemisphere, North America





## Achievements – 6



- DBCP 20 – EGOS to E-Surfmar; SOT support endorsed; leaflet on vandalism published; communication with IHO, IMO, FAO; metadata initiative includes manufacturers
- 2005 – buoy 1250 launched at JCOMM II; need to increase barometer buoys to 50% of array; concept of including tsunameter buoys in DBCP; data delays for GTS an issue; Frank Grooters became Financial Advisor to DBCP



# Drifter 1250 prior to deployment





# Drifter 1250 Deployed





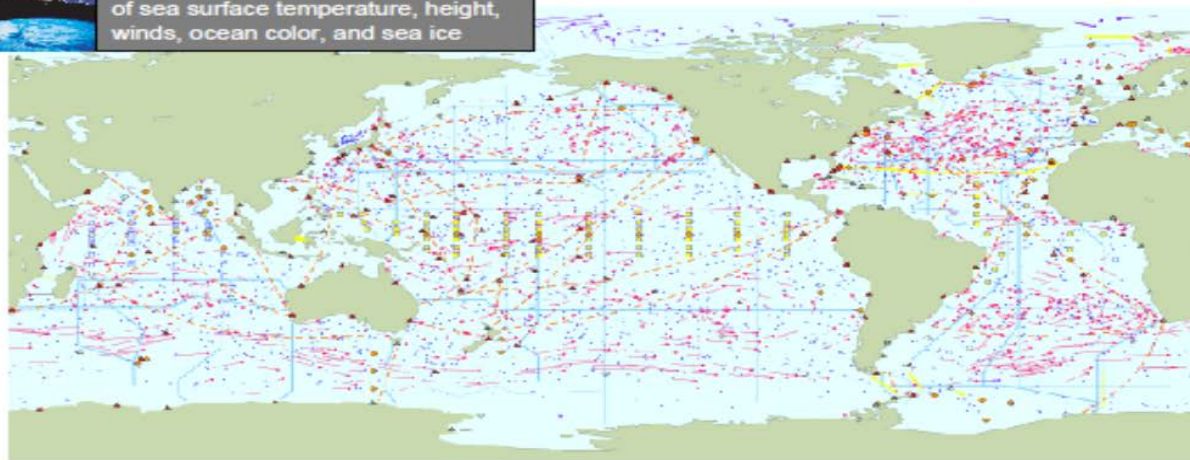
# In Situ Network Status



continuous satellite measurements of sea surface temperature, height, winds, ocean color, and sea ice

Total in situ networks **67%**

Dec 2014

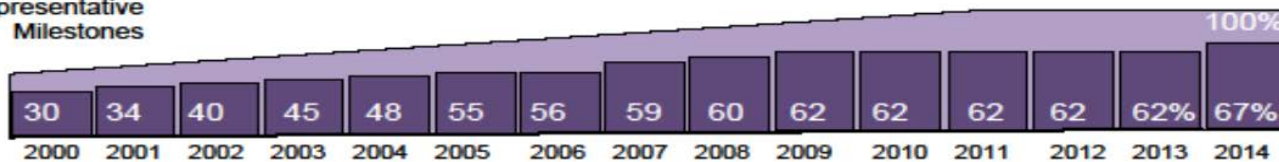


- 100%** Surface measurements from volunteer ships (VOS)
  - 250 ships in VOSclim pilot project
- 100%** Global drifting surface buoy array
  - Ice buoys
  - 5° resolution array: 1250 floats
- 40%** Tide gauge network (GLOSS committed)
  - 300 real-time reporting gauges
- 39%** XBT sub-surface temperature section network
  - 37000 XBTs deployed
- 100%** Argo profiling float network
  - 3° resolution array: 3200 floats
- 62%** Repeat hydrography and carbon inventory
  - Planned
  - Full ocean survey in 10 years

**66%** Global time series network  
 87 combined sites

**76%** Global tropical moored buoy network  
 125 moorings planned

Representative Milestones



Original goal for full implementation by 2010

System % sustained, of initial goals



## Achievements - 7



- DBCP 23 – JCOMMOPS web site now hosting DBCP; sessions re-organized to be 4 days; every 2<sup>nd</sup> year meeting to be in Geneva or Paris; formally established Task Teams; tether strain adopted as drogue loss standard; SOT duties transferred to Argo TC; OceanSITES duties assumed by TC; iridium PP endorsed; CB building set as a priority
- DBCP 24 – updated Operating Principles and Implementation Strategy; ITP endorsed as Action



# OceanSITES Platform-





# Iridium SVPB Drifter





## Achievements – 8



- Group; PPs on Argos 3; Wave Measurements from Drifters; Wave Evaluation and Test from Moored Buoys
- DBCP 25 – inter-comparison study on buoys completed; 1<sup>st</sup> WIO CB workshop; PP on HRSST endorsed; anti-vandalism efforts renewed; iridium drifters being used to improve timeliness
- 2010 – manufacturers invited to nominate an observer for EB; data timeliness improved; concept of satellite forum endorsed





## Achievements – 9



- DBCP 27 – new TC reported at JCOMMOPS after gap of 11 months; meeting format revised to provide for side meetings on Day 2; significant drop in number of operational drifters due to technical issues; WIO -2 CB workshop in Mauritius; PP Argos 3 successfully concluded; PPs on WMD and WET merged to become PP WET; PP on impact of SLP on NWP established; DBCP Technical Document on Vandalism finalized; ToRs for Panel revised so rigs and platforms included



## Achievements - 10



- 2012 – 3 Capacity Building workshops held – Mombasa (WIO-3), Jeju (NPOMS-1) and Chennai (Best Practices for Instruments and Methods of Ocean Observation); Iridium PP completed; hosted Workshop on the Evaluation of the Impact of SLP Data Over the Ocean from Drifting Buoys on NWP; responded to WIGOS and GFCS; initiated recruitment of new TC
- DBCP 29 - TT-IBPD resulted in many useful Panel recommendations to buoy operators and



## Achievements - 11



- manufacturers, such as the need for hardened battery packs and better drogue attachment; JCOMMOPS Ship Coordinator Martin Kramp hired in February 2013; WG on Vandalism continues to use multiple approaches to address issue;
- 2014 – JCOMMOPS operational in Brest; new TC recruited; 22% increase in operational drifters;



## Achievements - 12



- Moored buoy performance also improved; PP-SLP had OSE completed on impact of pressure from drifters on NWP; PP-HRSST suspended; consideration of user requirements



## TT - CB



- established at DBCP-24 in Jeju South Korea
- During this time we have been successful in raising awareness of the DBCP in many countries around the world, both developing and developed States
- Over 400 participants have contributed to 11 CB workshops in Asia, Western Indian Ocean, North Pacific Ocean and Marginal Seas, and Pacific Islds
- Trainees have received technical training as well as demonstrations on the social and economic practical applications of ocean observations



# WIO – DB 5 Port Elizabeth, SA





# CB Next



- Upcoming NPOMS 4
- DBCP Training Center for Tropical Cyclone-Ocean Interactions established this summer at Pusan National University



## From the beginning



- Data archival and quality control – MEDS and SOC
- WMO and IOC Secretariats
- Australia, Canada, France, Netherlands, UK, USA
- JTA
- CLS





# Where?



- France – 8 – Paris, Toulouse, La Reunion, Martinique
- USA – 4 – New Orleans, Marathon, La Jolla
- Switzerland – 3 – Geneva
- Australia – 3 – Melbourne, Perth, Fremantle
- South Africa – 2 – Pretoria, Cape Town
- UK – Henley on Thames, Oban
- Argentina, Brazil, Canada, China, Greece, India, Korea, New Zealand



# Next Steps



- Work in Progress
  - Complete information gathering and analysis
- Finalize format and content
- Review and Edit
- Publish
  
- Comments, input, suggestions to  
[alton.wallace@shaw.ca](mailto:alton.wallace@shaw.ca)